

Amendments to the Specification:

Please delete the paragraph beginning at page 5, line 27 of the specification.

Please replace the paragraph beginning at page 7, line 9 with the following rewritten paragraph:

b1
-- ~~Figure 3 is a flowchart illustrating a~~ A basic sol-gel process that has been previously proposed to deposit ELK films. ~~As shown in Fig. 3, the~~ The first step is the synthesis of the stock precursor solution (~~step 300~~). The stock precursor solution is prepared, for example, by combining a soluble silicon oxide source, e.g., TEOS (tetraethoxysilane), water, a solvent, e.g. alcohol, and an acid catalyst, e.g. hydrochloric acid, in particular mole ratios at certain prescribed environmental conditions and mixed for certain time periods.--

Please replace the paragraph beginning at page 7, line 15 of the specification with the following rewritten paragraph:

b2
--Once the stock solution is obtained, the coating solution is mixed (~~step 310~~).
The general procedure to prepare the coating solution is to add a surfactant to the stock solution. The surfactants are used as templates for the porous silica. In later processes the surfactants are baked out, leaving behind a porous silicon oxide film. Typical surfactants exhibit an amphiphilic nature, meaning that they can be both hydrophilic and hydrophobic at the same time. Amphiphilic surfactants possess a hydrophilic head group or groups which have a strong affinity for water and a long hydrophobic tail which repels water. The long hydrophobic tail acts as the template member which later provides the pores for the porous film. Amphiphiles can aggregate into supramolecular arrays which have the desired structure to be formed as the template for the porous film. Templating oxides around these arrays leads to materials that exhibit controllable pore sizes and shapes. The surfactants can be anionic, cationic, or nonionic, though for the formation of dielectric layers for IC applications, non-ionic surfactants are generally preferred.

The acid catalyst is added to accelerate the condensation reaction of the silica around the supramolecular aggregates.--

Please replace the paragraph beginning at page 7, line 29 of the specification with the following paragraph:

03
--After the coating solution is mixed, it is deposited on the substrate (~~step 320~~) using a spinning process where centrifugal draining ensures that the substrate is uniformly coated with the coating solution. The coated substrate is then pre-baked to complete the hydrolysis of the TEOS precursor, continue the gelation process, and drive off any remaining solvent from the film (~~step 330~~).--

Please replace the paragraph beginning at page 8, line 1 with the following paragraph:

04
--The pre-baked substrate is then further baked to form a hard-baked film (~~step 340~~). The temperature range chosen for the bake step will ensure that excess water is evaporated out of the spin cast film. At this stage the film is comprised of a hard-baked matrix of silica and surfactant with the surfactant possessing an interconnected structure characteristic of the type and amount of surfactant employed. The interconnected structure aids the implementation of the subsequent surfactant extraction phase. The interconnected structure provides continuous pathways for the subsequently ablated surfactant molecules to escape from the porous oxide matrix.--

Please replace the paragraph beginning at page 8, line 9 with the following rewritten paragraph:

05
--Typical silica-based films often have hydrophilic pore walls and aggressively absorb moisture from the surrounding environment. If water, which has a dielectric constant (k)

of about 78, is absorbed into the porous film, then the low k dielectric properties of the film can be detrimentally affected. Often these hydrophilic films are annealed at elevated temperatures to remove moisture and to ablate and extract the surfactant out of the silica-surfactant matrix. Such an anneal step leaves behind a porous film exhibiting interconnected pores (~~step 350~~). But this is only a temporary solution in a deposition process since the films may still be sensitive to moisture absorption following this procedure.--

Please replace the paragraph beginning at page 8, line 17 with the following paragraph:

bl
--Some sol-gel processes include further post-deposition treatment steps that are aimed at modifying the surface characteristic of the pores to impart various desired properties, such as hydrophobicity, and increased resistance to certain chemicals. A typical treatment that renders the film more stable is treatment with HMDS (hexamethyldisilazane, $[(CH_3)_3Si-NH-Si(CH_3)_3]$), in a dehydroxylating process which will remove the hydroxyl groups, replace them with trimethylsilyl groups, and render the film hydrophobic (~~step 360~~). Alternatively, or in conjunction with such a silylation step, the porous material may be rendered more hydrophobic by the addition of an alkyl substituted silicon precursor, such as $CH_3Si(OCH_2CH_3)$ methyl triethoxysilane or MTES to the precursor formulation.--

Please replace the paragraph beginning at page 8, line 31 with the following rewritten paragraph:

b1
--For example, an alternate process for depositing and forming a hardened and stable ELK film according to an embodiment of the present invention is provided below. Using this alternate process, an ELK film was deposited based on a sol-gel-based process as described above ~~by steps 300-350~~. ~~During steps 300-350 a~~ A precursor solution containing at least a silica precursor composed primarily of a silicon/oxygen compound, water, a solvent, a surfactant and a catalyst was formed. The precursor solution was spun on the wafer and the wafer thermally treated by being baked in a chamber at various temperatures between about 90 °C and 450 °C for

between about 30 and 3600 seconds in inert or oxidizing environments having pressures in the range from about 0.1 Torr to atmospheric. The silicon/oxygen compound was selected from the group consisting of tetraethylorthosilicate, tetramethoxysilane, phenyltriethoxy, methyltriethoxysilane and combinations thereof. The solvent was selected from the group consisting of ethanol, isopropanol, propylene glycol monopropyl ether, n-propanol, n-butanol, t-butanol, ethylene glycol and combinations thereof. The surfactant was a non-ionic surfactant selected for example from the group consisting of polyoxyethylene oxides- propylene oxides- polyethylene oxides triblock copolymers, octaethylene glycol monodecyl ether, octaethylene glycol monohexadecyl ether, Triton™ 100, Triton™ 114 and related compounds and combinations thereof. More particularly, the precursor solution used in specific embodiments of this invention has the following composition: tetraethoxysilane (TEOS) - 22.5 gms; methyltriethoxysilane (MTES) - 22.5 gms; propylene glycol monopropyl ether (PGPE) - 100 gms; 0.1N Nitric acid - 24 gms; tetraethylammonium hydroxide (TMAH)(2.4% in water) - 1.0 gms; and Triton X-114 - 9.67 gms (Triton 114 is trademark of a mixture of ethoxylated p-tert-octylphenols manufactured by the Union Carbide Corporation).--
